

REMARKS

Claim 1 is amended by incorporating the subject matter of claim 7. In view of the amendment to claim 1, claim 7 is canceled and claims 8-10 are amended to change their dependency. Other editorial amendments are made to claims 4, 6, 16, 18-21, 24 and 25. New claims 27-29 are added, which are supported by the claims as originally filed. New claim 30 is added, which is supported by the original specification at page 10, lines 5-6.

No new matter is presented.

II. Response to Obviousness Double Patenting Rejections

A. U.S. App. Ser. No. 10/583,339 (U.S. Pub. No. 2007/0164468)

Claims 1-5, 7-10, and 12-26 are provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-4, 6-10, 12, 13, and 15-22 of co-pending Application No. 10/583,339 (U.S. Pub. No. 2007/0164468).

B. U.S. App. Ser. No. 10/583,711 (U.S. Pub. No. 2007/0151679)

Claims 1-5 and 7-26 are provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-4, 6, and 8-20 of co-pending Application No. 10/583,711 (U.S. Pub. No. 2007/0151679).

C. U.S. App. Ser. No. 10/583,712 (U.S. Pub. No. 2007/0131362)

Claims 1-5 and 7-26 are provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-4, 6, and 8-20 of co-pending Application No. 10/583,712 (U.S. Pub. No. 2007/0131362).

D. U.S. App. Ser. No. 10/583,340 (U.S. Pub. No. 2007/0163735)

Claims 1-5, 7, and 12-16 are provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-17 and 19 of co-pending Application No. 10/583,340 (U.S. Pub. No. 2007/0163735).

Applicants defer responding to the provisional obviousness double patenting rejections.

II. Response to Claim Objections

In paragraph 8 of the Office Action, claim 7 is objected to because there is a space missing in the term “claim1”.

Claim 7 is canceled herein, thereby obviating the objection.

Claim 18 is objected to under 37 C.F.R. §1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Specifically, the Examiner states that claim 18 is dependent on claim 17 which only discloses two types of enzymes and claim 18 further expands this to more than two types of enzymes.

Claim 18, is amended to depend from claim 14, thereby obviating the objection.

Claim 24 is objected to because there is a period missing at the end of the claim.

Claim 24 is amended herein by inserting a period at the end of the claim, thereby obviating the objection.

III. Claim Rejections under 35 U.S.C. § 112

A. 35 U.S.C. § 112, 1st Paragraph

In paragraph 12 of the Office Action, claim 25 is rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. The Examiner states that the

claim states that radiation capable of oxidizing the fibrous material should be used; however, neither the specification nor the claim state in any manner how much radiation is needed, where and when the radiation is used on the fibrous material (low consistency, medium consistency, or once a sheet has been formed), and finally it is not clear whether the radiation requires or doesn't require the other oxidizing agents (the enzymes, peroxides, etc.).

Applicants traverse the rejection.

The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation. A patent need not teach, and preferably omits, what is well known in the art.

In this case, the specification discloses at page 8, lines 1-3, that radical forming radiation comprises gamma radiation, electron beam radiation or any high energy radiation capable of forming radicals in a lignocellulose or lignin containing material. One of ordinary skill in the art is capable of adjusting the radiation such that radicals are created in the fibrous material. Therefore, the specification is sufficiently enabling to those of ordinary skill in the art. Accordingly, Applicants request withdrawal of the §112, 1st paragraph rejection.

B. 35 U.S.C. § 112, 2nd Paragraph

In paragraph 14 of the Office Action, claims 6, 8, 16, 19, 20, 21, and 25 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

1. Regarding claim 6, the phrase "derivatives thereof" is said to render the claim indefinite.

Applicants traverse the rejection. Applicants submit that claim 6 recites that the electrically conductive polymer is selected from the group consisting of polyaniline, polypyrrole, polythiophene and polyacetylene and derivatives thereof. The present specification teaches that the derivatives include alkyl and aryl derivatives and chlorine and bromine substituted derivatives at page 10, lines 5-6. Thus, when properly read in light of the specification, those of ordinary skill in the art can readily ascertain the meaning and scope of the claim.

Accordingly, Applicants respectfully request withdrawal of the rejection.

2. Regarding claim 8, the phrase “similar structural group” is said to render the claim indefinite.

The rejection is traversed.

Claim 8 is amended by to recite “similar structural groups capable of being oxidized”. Applicants submit that the specification teaches that groups similar to the phenolic groups are groups which are capable of being oxidized by suitable enzymes or chemically. Page 5, lines 25-26. Thus, when properly read in light of the specification, those of ordinary skill in the art are readily able to ascertain the meaning and scope of the claim.

Accordingly, Applicants respectfully request withdrawal of the rejection.

3. Regarding claim 16, the Examiner states that there is insufficient antecedent basis for recitation of the limitation “the enzyme” in line 1. The Examiner states that the ‘enzyme’ is not mentioned in claim 15 and that claim 16 should depend from claim 14.

Claim 16 is amended to depend from claim 14, thereby obviating the rejection.

4. Claim 19 is rejected for reciting both a broad range and a narrow range in the same claim. Specifically, the Examiner states that claim 19 recites the broad recitation 1-100,000 nkat/g, and the claim also recites 10-500 nkat/g which is the narrower statement of the range/limitation. The claim also states the limitation 0.0001 to 10 mg of enzyme per gram of dry matter which the Examiner states is a third range.

Further, with respect to claim 19, the Examiner states that the enzyme dosage, "nkat/g", is interpreted as referring to enzyme activity on pulp. However, the Examiner states that Applicants do not state what the defined assay conditions are for measuring the enzyme activity and, therefore, the Examiner cannot determine the proper metes and bounds of the claim since an enzyme can have different activity at different temperatures, pH's and depending on the substrate being oxidized.

Claim 19 is amended to delete the preferred range of the enzyme dosage, thereby obviating this aspect of the rejection.

The recitation of the amount of 0.0001 to 10 mg protein/g of dry matter in claim 19 relates to a different element from the enzyme dosage and therefore is not a narrower range of the enzyme dosage. Thus, Applicants traverse this aspect of the rejection.

Further, with respect to claim 19, the activation treatment is described at page 7, lines 12-19 of the specification. Also the conditions for determining enzyme activity are described in the working examples. Activity/amount of fibre and protein concentration are different ways of dosing. The determination of the enzyme activities has been carried out in the examples in the same conditions (pH, temperature) using standard activity measurements in the conditions in which the enzyme treatments of the materials have been effected.

Thus, in view of the above, one of ordinary skill in the art is readily able to ascertain the meaning and scope of the claims, when properly read in light of the specification.

5. Claim 20 is rejected for reciting both a broad range and a narrow range in the same claim. Specifically, the Examiner states that claim 20 recites the broad recitation 5-100 degrees C, and the claim also recites 10-85 and 20 to 80 degrees C which is the narrower statement of the range/limitation.

Claim 20 is amended to delete alternative ranges, thereby obviating the rejection.

6. Regarding claim 21, the phrase "such as" is said to render the claim indefinite.

Claim 21 is amended by deleting the phrase "such as", thereby obviating the rejection.

7. Claim 25 is rejected for reciting a use without any active, positive steps delimiting how this use is actually practiced. Specifically, the Examiner states that claim 25 provides for the use of radiation, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process Applicant is intending to encompass.

Claim 25 is amended herein to refer to the oxidizing step in claim 1, thereby obviating the rejection.

IV. Response to Claim Rejections under 35 U.S.C. § 102 and 103

A. Paragraph 19

Claims 1-9, 12-13, 15, and 21-26 are rejected under 35 U.S.C. §102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over U.S. Patent 5,211,810 to Bartholomew *et al.*

Applicants traverse the rejection.

The present invention relates to a process for producing a fibre composition comprising a lignocellulosic fibre material containing phenolic groups, and a synthetic, electrically conductive polymer formed by polymerized monomers. According to the process of the invention, the monomers are polymerized in the presence of the lignocellulosic fibre material to form a composition in which the polymer is bound to the fibres.

The process of the present invention comprises oxidizing the phenolic groups to provide an oxidized fibre material, contacting the oxidized fibre material with a bifunctional substance to provide a modified lignocellulosic fibre material capable of binding monomers of the conductive polymer, and contacting the modified lignocellulosic fibre material with monomers of the conductive polymer under conditions conducive to polymerization to produce polymer chains of the synthetic, electrically conductive polymer, which are grafted to the surface of the lignocellulosic fibre material. The bifunctional substance has at least two functional groups, where the first functional group participates in the binding of the modifying compound to the lignocellulosic fibre material and the second functional group forms a primer for binding to the polymeric material.

The present invention is based on the concept of first bonding a primer to the fibrous material and then, via that primer, a conductive polymer which is attached to the primer by *in-situ* polymerization of the corresponding monomers.

Bartholomew *et al.* does not disclose, teach or suggest the present invention. Bartholomew relates to chemical polymerization of a conductive polymer to a pigment. The pigment can then be used for separately coating of the surface of a fibrous structure. Polymerization chemicals, such as APS (ammonium persulfate) are – according to the disclosure of Bartholomew – not in direct contact with the fibrous material. Therefore the suggestion made in the Office Action that any phenolic groups would become oxidized is not correct. Thus, the present invention and Bartholomew are different from each other. For at least this reason, Bartholomew does not disclose, teach or suggest all elements of the present claims. Thus, the present invention as recited in independent claim 1 is not anticipated nor rendered obvious by Bartholomew *et al.* Claims 2-9, 12-13, 15 and 21-26 ultimately depend from claim 1 and are patentable for at least the same reasons.

Accordingly, Applicants respectfully request withdrawal of the rejection.

B. Paragraph 20

Claim 11 is rejected under 35 U.S.C. §103(a) as being unpatentable over Bartholomew *et al.*

Applicants respectfully traverse the rejection.

Bartholomew *et al.* does not disclose, teach or suggest all elements of claim 1 as discussed above. Claim 11 depends from claim 1 and is patentable for at least the same reasons.

Accordingly, Applicants respectfully request withdrawal of the rejection.

C. Paragraph 21

Claims 14, 16, 17, 18, 19 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bartholomew *et al.* in view of U.S. Patent 6,187,136 to Pedersen *et al.*

Applicants respectfully traverse the rejection.

Bartholomew *et al.* does not disclose, teach or suggest all elements of present claim 1 as discussed above and Pedersen *et al.* fails to remedy the deficiencies of Bartholomew *et al.*

In Pedersen *et al.*, the negative charge of the fibres is enzymatically increased by adding acid components to enhance the adsorption potential of the fibres and charged polymers. However, Pedersen *et al.* does not teach to directly bond a negatively charged bifunctional group to a fibre as a primer and to utilize that primer for attaching a polymer to the fibre. The examples of the present application show that both chemical and enzymatic binding of a primer to the fibre before the actual polymerization of the conductive polymer can provide a conductive fibrous material which cannot be reached without the preliminary step of adding a primer. See, e.g., page 15, Table 1.

Thus, even if combined, the present invention as recited in claim 1, would not have been achieved. Claims 14, 16, 17, 18, 19 and 20 ultimately depend from claim 1 and are patentable for at least the same reasons.

Accordingly, Applicants respectfully request withdrawal of the rejection.

D. Paragraph 22

Claims 1-10, 12-18 and 20-26 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent 6,187,136 to Pedersen *et al.*

Applicants respectfully traverse the rejection.

As discussed above, Pedersen *et al.* does not teach to directly bond a negatively charged bifunctional group to a fibre as a primer and to utilize that primer for attaching a polymer to the fibre as recited in amended claim 1. For at least this reason, claim 1 is not anticipated by Pedersen *et al.* Claims 2-10, 12-18 and 20-26 depend directly, or indirectly, from claim 1 and are distinguished for at least the same reasons.

Accordingly, Applicants respectfully request withdrawal of the rejection.

E. Paragraph 23

Claim 11 is rejected under 35 U.S.C. §103(a) as being unpatentable over Pedersen *et al.*

The Examiner relies on Pedersen *et al.* for the teaching that multiple monomers can be used to form and conductive polymer bound to the fiber. The Examiner takes the position that if a person of ordinary skill in the art were to use a mixture of the monomer disclosed by Pedersen *et al.* then the monomer and bifunctional substance would be different.

Applicants respectfully traverse the rejection.

Pedersen *et al.* does not disclose, teach or suggest all elements of claim 1 as discussed above. Claim 11 depends from claim 1 and is patentable for at least the same reasons.

Accordingly, Applicants respectfully request withdrawal of the rejection.

F. Paragraph 24

Claim 19 is rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Pedersen *et al.*

Applicants respectfully traverse the rejection.

Pedersen *et al.* does not disclose, teach or suggest all elements of claim 1 as discussed above. Claim 19 ultimately depends from claim 1 and is patentable for at least the same reasons.

Accordingly, Applicants respectfully request withdrawal of the rejection.

G. Paragraph 25

Claims 1-11 and 13-26 are rejected under 35 U.S.C. §103(a) as being unpatentable over Pedersen *et al.* in view of Bartholomew *et al.*

Neither of Pedersen *et al.* nor Bartholomew *et al.* teaches or suggest all elements of claim 1 as discussed above. Therefore, even if combined, the claimed invention would not have been achieved. Thus, the present invention is not rendered obvious by the cited references, whether taken alone or in combination.

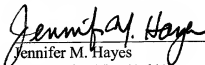
Accordingly, Applicants respectfully request withdrawal of the rejection.

V. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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